

EFFECT OF FARM SIZE AND FREQUENCY OF CUTTING ON OUTPUT OF FLUTED PUMPKIN (*Telfeiria sp.*) IN ITU LOCAL GOVERNMENT AREA OF AKWA IBOM STATE, NIGERIA.

D. S. UDOM, I. C. IDIONG AND H. E. UMOH

(Received 22 November 2001; Revision accepted 28 June 2002)

ABSTRACT

The study was carried out to ascertain the effect of farm size and frequency of cutting on the output of fluted pumpkin (*Telfeiria sp.*) through a survey of some farms in Itu Local Government Area of Akwa Ibom State. Thirty-two farmers were selected and interview schedules administered to them to obtain the relevant information. A multiple regression involving the use of Ordinary Least Squares (OLS) estimation technique was used in analyzing the data so collected. The results indicated that the farm size and frequency of cuttings had positive impact and was significant at the one per cent level. The elasticity of production with respect to farm size was 0.71 while that with respect to frequency of cutting was 1.93. It was therefore recommended that research should be conducted to ascertain optimum frequency of cutting that would produce maximum output of the vegetable as well as the development of high yielding variety to enhance land productivity.

KEYWORDS: Farm size, frequency of cuttings, fluted pumpkin, output.

INTRODUCTION

Fluted pumpkin (*Telfeiria sp.*) a warm weather crop grows well in low lands and can tolerate elevation of about 960m (Tindall, 1975). It thrives best in temperature between 30°C and 50°C in the tropics and in rich soils in organic matter (Irvine, 1977). Philip (1977) reported that, the two species of this crop are cultivated all year round with irrigation in Nigeria. The average yield per hectare has been put between 5 and 6 tonnes of leaf yield.

Fluted pumpkin plays an important role in human and livestock nutrition. It is a cheap source of protein, oil and fat. It contains about 21 per cent and 13 per cent of protein and fat respectively, (Oyenuga, 1968 and Tindall, 1975). The leaves of this vegetable are used in the preparation of several delicacies in Southern Nigeria one of which is "Edikang ikong" soup (a popular delicacy of the Efiks in Cross River State). The production of this vegetable like most leafy vegetables has been found to be quite profitable and financially viable for investment (Josiah, 1990 and Igonibo, 1997).

However, the resource base of the farmers who are predominantly women have made it difficult for them to expand output to meet the increasing demand of consumers especially during the dry season. Output per hectare of this vegetable can be increased by the use of fertilizers (organic and inorganic) (Wancke and Luther, 1980; William and Jones, 1986). Akpan (1991) and Odok (1994) also reported that increasing farm size also results in increasing output of some vegetables. The increasing cost of fertilizer coupled with the low financial status of the farmers have made its acquisition and use quite difficult by these resource poor farmers. Hence, the use of some agronomic practices coupled with increasing farm size appears quite expedient in increasing output per hectare of this vegetable.

OBJECTIVES OF THE STUDY:

The study was carried out to;

- i. Determine the farm sizes and number of times of harvesting of the crop by farmers in Itu Local Government Area of Akwa Ibom State.
- ii. Ascertain the effect of farm size and frequency of cutting on the output of *telfeiria* in the area and

make recommendations based on the findings of the study.

METHODOLOGY.

Study Area: The study was conducted at Ikot Offiong in Itu Local Government Area of Akwa Ibom State. The area, which is riverine, is well known for the cultivation of this vegetable usually along the riverbanks. Inhabitants of this area are also engaged in the cultivation of okra, pepper, cocoyam etc. and fishing activities. Many of the farmers are involved in the sole cropping of this vegetable.

METHOD OF DATA COLLECTION

The data used in the study were from primary sources, through the use of cost route approach.

A sample of thirty-two (32) farmers from a population randomly selected for the study. These persons also were engaged in the cultivation of *telfeiria* as a sole crop. The information obtained includes size of plots in square meters (m^2) and converted to hectares; weight of harvested leaves in kilogrammes (kg) and the number of times the leaves were harvested. Farm sizes were determined by measuring with a tape, while the weight of the leaves was also determined by the use of a weighing balance.

DATA ANALYSIS

The data so obtained was analysed using the Ordinary Least Square (OLS) multiple regression techniques. Both the Linear and log-linear functional forms were used to enable the adoption of a model that would best fit the relationship. The linear functional form took the form below:

$$Y = a_0 + a_1X_1 + a_2X_2 + U \quad (1)$$

Where Y = output of fluted pumpkin leaf (kg).

X_1 = farm size in hectares

X_2 = frequency of cutting

U = error term

a_1 and a_2 are regression coefficients while a_0 is the y- intercept.

The double log. functional form was of the form

$$\ln Y = \ln a_0 + a_1 X_1 + a_2 \ln X_2 + U \quad (2)$$

Where Y , X_1 , X_2 , U , a_0 , a_1 and a_2 are as defined in equation (1).

And \ln is the natural logarithm.

The elasticity of production with respect to the explanatory variables were also estimated using formula below

Where = elasticity of production

X = explanatory variable at the mean

Y = independent variable at the mean

a = regression slope

However, for the log-linear model, the coefficients of the explanatory variables are their elasticities.

RESULTS.

A. Mean output, farm size and frequency of cutting of fluted pumpkin in the study area. The total output of fluted pumpkin harvested by the respondents in the area was 75070 kg while the mean output/farmer was 2343.94 kg. The means of farm size and frequency of cutting were 0.13 hectares and 6.4 times respectively (see Table in Appendix). The size of farm is an indication of the small-scale nature of production of the crop by farmers in the area.

B. Regression estimates

i. Linear regression estimates

$$Y = -3217.441 + 12301.174X_1 + 633.032X_2 \quad (3)$$

(1907.174) (157.114)

$$R^2 = 0.86, \text{adj}R^2 = 0.85, \text{F-ratio} = 90.503$$

ii. Log Linear regression estimates

$$\ln Y = 5.58 + 0.709 \ln X_1 + 1.930 \ln X_2 \quad (4)$$

(15.791) (2.45)

$$R^2 = 0.86, \text{adj}R^2 = 0.85, \text{F-ratio} = 81.267$$

Note: Standard errors in parenthesis

* Significant at 1 per cent level

Equations 3 and 4 show the estimated linear and log-linear functional forms. The coefficients of the explanatory variables (farm size and frequency of cutting) carry positive signs in both models. The coefficients were significant at the 1 per cent level in both models. The coefficients of multiple determination (R^2) were 0.86 and 0.86 for the linear and log-linear models respectively. The F-ratios were 90.503 and 81.267 for both linear and log-linear models respectively. The F-ratios at 29 degrees of freedom indicated the overall significance of the equations when compared with the tabulated value of 2.93 at the one per cent level. The double logarithmic function was selected as the lead equation.

The selection was not only based on econometric, statistical or a priori reasons, but also as a result of its ability to show diminishing marginal returns and returns to scale, which is characteristic of agricultural production. The linear function does not satisfy these conditions (Sankhayan, 1988 and Upton, 1997).

DISCUSSION.

The coefficients of farm size and frequency of cutting carrying positive signs and significant at the one per cent level respectively indicate that an increase in farm size and frequency of cutting will significantly increase the output of fluted pumpkin in the area. Akpan (1991) and Odok (1994) obtained similar results in their studies on some other vegetables. The variables accounted for about 86 per cent of the variability in output of *telfeiria* in the area.

The elasticity of production with respect to farm size was 0.71. This implies that a one per cent increase (decrease) in farm size will lead to a 0.71 per cent increase (decrease) in output of vegetable. The value also shows that, the farmers were producing in stage one of the production function. This indicated irrationality in the use of land as a resource. On the other hand, the elasticity of production with respect to frequency of cutting, which was 1.93 implied that a one per cent increase (decrease) in frequency of cutting will result in a 1.93 per cent increase (decrease) in output of *telfeiria*.

CONCLUSION.

The increasing demand for vegetables in general and fluted pumpkin in particular in Akwa Ibom State calls for efforts that are geared towards increasing output per hectare. The study has shown that increasing farm size and frequency of cutting can be a worthwhile decision in small-scale *telfeiria* production.

RECOMMENDATIONS

1. Research should be conducted to ascertain the optimum frequency of cutting that would enhance maximum output of *telfeiria*.
2. The Agricultural Development Programme (ADP) in the State should make results of such research available to the farmers through an effective extension service.
3. Farmers should be encouraged to increase their farm size. However, where land acquisition is difficult, high yielding varieties should be cultivated to enhance land productivity.

REFERENCES

- Akpan, E. E., 1991. Cost and returns in small-scale farming. Unpublished B. Sc. Dissertation, River State University of Science and Technology, Port Harcourt.
- Igonibo, A., 1997. Economics of commercial vegetable production in Port Harcourt Metropolis. Unpublished B. Sc. Dissertation, River State University of Science and Technology, Port Harcourt.
- Irvine, F. R., 1977. A Textbook of West African soil and crop. Oxford University Press.
- Josiah, I. B., 1990. Vegetable production in traditional farming system in Calabar. Unpublished B. Sc. Dissertation, Department of Agricultural Economics and Extension, University of Calabar, Calabar.
- Odok, G. N., 1994. Economic returns in small-sized mixed farms in Boki Local Government Area of Cross River State. Unpublished B. Sc. Dissertation, Department of Agricultural Economics and Extension, University of Calabar, Calabar.
- Oyenuga, V. A., 1968. Nigerian foods and feeding stuffs: Their chemistry and nutritive value. Ibadan University Press.
- Philips, T. A., 1977. An Agricultural Notebook. Longman Ltd. London.
- Sankhayan, P. L., 1988. Introduction to the economics of agricultural production. Prentice Hall of India Private Ltd. New Delhi.
- Tindall, H. D., 1975. Commercial vegetable growing. Oxford University Press. London.
- Upton, M., 1997. The Economics of tropical farming systems. Cambridge University Press, Cambridge, UK.

- Wancke, J. W. and Luther, J., 1980. Organic farming becomes legitimate. *Journal of soil science*. (1)20: 254-256.
- William, U. U. and Jones, I., 1986. *Fertilizer and soil fertility*. Virginia-Roston Publishing Company.